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TITLE: TECHNICAL VIRTUAL ADVISOR

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TECHNICAL VIRTUAL ADVISOR

FIELD OF THE INVENTION

The invention relates to vehicles, and more particularly to methods and systems for managing technical services within a mobile vehicle communications system.

BACKGROUND OF THE INVENTION

Many passenger vehicles now incorporate an integrated communication system. A Vehicle Communication Unit (VCU) used in conjunction with a Wide Area Network (WAN) such as a cellular telephone network or a satellite communication system allows for a variety of fee-based subscription services to be provided in a mobile environment. The VCU is typically a vehicle telematics device including a cellular radio, satellite transceiver and a global positioning system (GPS). Communication through a carrier service may be initiated at the VCU at turn-on or through manual or voice command phone number entry. Typically, a radio communication link is established between the VCU and a Wide Area Network (WAN), using a node of the WAN in the vicinity of the VCU. In addition to enabling telecommunication services, a telematics device may be configured to perform various processing functions and to exchange various types of data through a service provider.

In order to provide telematics services to a customer, various software updates, reconfigurations, and other forms of technical services may be required at the customer's telematics device. One solution for providing such services involves automated technical services download to the telematics device from the service center. However, when a service provider is unable to provide the technical services to a telematics unit due to an intervening cause, such as when a telematics device is operating defectively, the vehicle must be brought to a

service facility such as a dealership for technical services and maintenance. A service provider typically offers various services to a subscriber including the assistance of a live advisor. If a customer is aware of a telematics malfunction or desires some form of technical services, an advisor at a service center may be able to provide assistance. However, many types of technical services require the upload of data to a telematics device, and in some cases diagnostic functions as well. In order to provide such services to a client, an advisor may be required to transfer a customer to a technically trained customer service agent or department in order to diagnose problems or implement technical services. Transfer of customers to other advisors and departments is undesirable due to inherent organizational inefficiencies and potential customer dissatisfaction.

It would be desirable therefore, to provide a method and system for managing technical services within a mobile vehicle communications system that overcomes these and other disadvantages.

SUMMARY OF THE INVENTION

The present invention is directed to a method of managing technical services within a mobile vehicle communications system that includes receiving a request for technical services from a telematics device, determining a technical service action based on the received request for technical services, and providing a technical service to the telematics device responsive to the technical service action determination.

In accordance with yet another aspect of the invention, a computer readable medium includes computer readable code for controlling a communication interface implemented to receive a request for technical services from a telematics device, computer readable code for determining a technical service action based on the received request for technical services, and computer readable code for providing a technical service to the telematics device responsive to the technical service action determination.

In accordance with still another aspect of the invention, a system for managing technical services within a mobile vehicle communications system includes means for receiving a request for technical services from a telematics device, means for determining a technical service action based on the received request for technical services, and means for providing a technical service to the telematics device responsive to the technical service action determination.

The foregoing and other features and advantages of the invention will become further apparent from the following detailed description of the presently preferred embodiment, read in conjunction with the accompanying drawings. The detailed description and drawings are merely illustrative of the invention rather than limiting, the scope of the invention being defined by the appended claims and equivalents thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 is an illustrative operating environment for managing technical services within a mobile vehicle communications system in an embodiment of the present invention;

FIG. 2 is a block diagram of a system for managing technical services within a mobile vehicle communications system in accordance with an embodiment of the present invention; and

FIG. 3 is a process flow diagram illustrating a method for managing technical services within a mobile vehicle communications system in an embodiment of the present invention.

DETAILED DESCRIPTION OF THE
PRESENTLY PREFERRED EMBODIMENT

FIG.1 is an illustrative operating environment for managing technical services within a mobile vehicle communications system in an embodiment of the present invention. FIG. 1 shows a mobile vehicle communication system **100**. Mobile communication system **100** includes at least one mobile vehicle **110** (vehicle) including vehicle communication bus **112** and vehicle communications unit (VCU) **120**, one or more wireless carrier systems **140**, one or more communication networks **142**, one or more land networks **144**, one or more client, personal or user computers **150**, one or more web-hosting portals **160**, and one or more call centers **170**. In one embodiment, mobile vehicle **110** is implemented as a vehicle equipped with suitable hardware and software for transmitting and receiving voice and data communications.

In one embodiment, vehicle communications unit **120** is a telematics device that includes a digital signal processor (DSP) **122** connected to a wireless modem **124**, a global positioning system (GPS) unit **126**, an in-vehicle memory **128**, such as, for example, a non-volatile flash memory, a microphone **130**, one or more speakers **132**, and an embedded or in-vehicle mobile phone **134**. In one embodiment, DSP **122** is a microcontroller, controller, host processor, or vehicle communications processor. In an example, DSP **122** is implemented as an application specific integrated circuit (ASIC). GPS unit **126** provides longitude and latitude coordinates of the vehicle. In-vehicle mobile telephone system **134** is a cellular-type phone, such as, for example an analog, digital, dual-mode, dual-band, multi-mode or multi-band cellular phone. In another example, the mobile telephone system is an analog mobile telephone system operating over a prescribed band nominally at 800 MHz. In another example, the mobile telephone system is a digital mobile telephone system operating over a prescribed band nominally at 800 MHz, 900 MHz, 1900 MHz, or any suitable band capable of carrying digital cellular communications.

DSP **122** executes various computer programs and communication control and protocol algorithms that affect communication, programming and operational modes of electronic and mechanical systems within vehicle **110**. In one embodiment, DSP **122** is an embedded system controller. In another embodiment, DSP **122** affects communications between telematics device **120**, wireless carrier system **140**, and call center **170**. In another embodiment, DSP **122** provides the functionality of a human speech recognition system (ASR) module. In still another embodiment, DSP **122** provides data processing, analysis and control functions to facilitate technical services management. DSP **122** is configured to generate and receive digital signals transmitted between telematics device **120** and a vehicle communication bus **112** that is connected to various electronic modules in the vehicle **110**. In one embodiment, the digital signals activate a programming mode and various operational modes, as well as facilitate data transfers. In another embodiment, a program facilitates the transfer of service data such as instructions, triggers and data requests between vehicle **110** and a call center **170**.

Mobile vehicle **110**, via a vehicle communication bus **112**, sends signals to various units of equipment and systems within vehicle **110** to perform various functions such as monitoring the operational state of vehicle systems, collecting and storing data from the vehicle systems, providing instructions, data and programs to various vehicle systems and outpulsing (dialing) calls from telematics device **120**. In facilitating interactions among the various communication and electronic modules, vehicle communication bus **112** utilizes bus interfaces such as controller-area network (CAN), International Organization for Standardization (ISO) Standard 9141, ISO Standard 11898 for high-speed applications, ISO Standard 11519 for lower speed applications, and Society of Automotive Engineers (SAE) standard J1850 for higher and lower speed applications. In one embodiment, vehicle communication bus **112** is a direct connection between connected devices.

Vehicle **110**, via telematics device **120**, sends and receives radio transmissions from wireless carrier system **140**. Wireless carrier system **140** is implemented as any suitable system for transmitting a signal from mobile vehicle **110** to communication network **142**. Wireless carrier system **140** incorporates any type of telecommunications in which electromagnetic waves carry signal over part of or the entire communication path. In one embodiment, wireless carrier system **140** transmits analog audio and/or video signals. In an example, wireless carrier system **140** transmits analog audio and/or video signals such as those sent from AM and FM radio stations and transmitters, or digital audio signals in the S band (approved for use in the U.S.) and L band (used in Europe and Canada). In one embodiment, wireless carrier system **140** is a satellite broadcast system broadcasting over a spectrum in the "S" band (2.3 GHz) that has been allocated by the U.S. Federal Communications Commission (FCC) for nationwide broadcasting of satellite-based Digital Audio Radio Service (DARS).

Communication network **142** includes services from one or more mobile telephone switching offices and wireless networks. Communication network **142** connects wireless carrier system **140** to land network **144**. Communication network **142** is implemented as any suitable system or collection of systems for connecting wireless carrier system **140** to mobile vehicle **110** and land network **144**. In one example, wireless carrier system **140** includes a short message service, modeled after established protocols such as IS-637 SMS standards, IS-136 air interface standards for SMS, and GSM 03.40 and 09.02 standards. Similar to paging, an SMS communication could be broadcast to a number of regional recipients. In another example, the carrier system **140** uses services in accordance with other standards, such as, for example, IEEE 802.11 compliant wireless systems and Bluetooth compliant wireless systems. In another embodiment, a cellular System Identifier (SID) table at telematics device **120** identifies a preferred carrier system **140**. In an example, a telematics device **120** initiating a communication through communication network **142** selects a

preferred carrier or a secondary carrier based on an SID table and prevailing network traffic and other considerations. In one embodiment, a preferred or secondary carrier identified in an SID table is configured with a home location register (HLR). In another embodiment, a visitor location register VLR connects two HLRs for operation, as is understood in the art. In yet another embodiment, a so-called "side-switch carrier change" is enabled to change from one carrier to another between calls as will be known to the skilled practitioner. In an embodiment, a carrier having a home location register enables authenticated call connections with a "handshake" exchange of telematics device and service center identification data after the authentication.

Land network **144** is a public-switched telephone network (PSTN). In one embodiment, land network **144** is implemented as an Internet protocol (IP) network. In other embodiments, land network **144** is implemented as a wired network, an optical network, a fiber network, another wireless network, a virtual private network (VPN) or any combination thereof. Land network **144** is connected to one or more landline telephones. Land network **144** connects communication network **142** to user computer **150**, web-hosting portal **160**, and call center **170**. Communication network **142** and land network **144** connects wireless carrier system **140** to web-hosting portal **160** and call center **170**.

Client, personal or user computer **150** includes a computer usable medium to execute Internet browser and Internet-access computer programs for sending and receiving data over land network **144** and optionally, wired or wireless communication networks **142** to web-hosting portal **160** and vehicle **110**. Personal or user computer **150** sends data to web-hosting portal through a web-page interface using communication standards such as hypertext transport protocol (HTTP), and transport-control protocol Internet protocol (TCP/IP). In one embodiment, the data includes directives to change certain programming and operational modes of electronic and mechanical systems within vehicle **110**, or telematics device **120**. In another embodiment, the data includes requests for

certain data such as telematics device **120** diagnostic data. In operation, a user, such as, for example, a vehicle designer or manufacturing engineer, utilizes user computer **150** to exchange data with mobile vehicle **110** that is cached or stored in web-hosting portal **160**. In an embodiment, mobile vehicle data from client-side software is transmitted to server-side software of web-hosting portal **160**. In another embodiment, user account, vehicle, and telematics device identification data is stored at web-hosting portal **160**. In another embodiment, client computer **150** includes a database (not shown) for storing received identification data and technical services action request data. In yet another embodiment, a private Local Area Network (LAN) is implemented for client computer **150** and Web hosting portal **160**, such that web hosting portal is operated as a Virtual Private Network (VPN).

Web-hosting portal **160** includes one or more data modems **162**, one or more web servers **164**, one or more databases **166**, and a network **168**. Web-hosting portal **160** is connected directly by wire to call center **170**, or connected by phone lines to land network **144**, which is connected to call center **170**. Web-hosting portal **160** is connected to land network **144** by one or more data modems **162**. Land network **144** sends digital data to and from modem **162**; data that is subsequently transferred to web server **164**. In one implementation, modem **162** resides inside web server **164**. Land network **144** transmits data communications between web-hosting portal **160** and call center **170**.

Web server **164** receives various data, requests or instructions from user computer **150** via land network **144**. In alternative embodiments, user computer **150** includes a wireless modem to send data to web-hosting portal **160** through a wireless communication network **142** and a land network **144**. Data is received by modem **162** and sent to one or more web servers **164**. In one embodiment, web server **164** is implemented as any suitable hardware and software capable of providing web services to transmit and receive data from user computer **150** to telematics device **120** in vehicle **110**. Web server **164** sends to or receives data

transmissions from one or more databases **166** via network **168**. In an embodiment, web server **164** includes computer applications and files for managing emission performance data.

In one embodiment, one or more web servers **164** are networked via network **168** to distribute vehicle identification and technical services action request data among its network components such as database **166**. In an example, database **166** is a part of or a separate computer from web server **164**. In one embodiment, web-server **164** sends data transmissions including emission performance data to call center **170** via modem **162**, and through land network **144**.

Call center **170** is a location where many calls are received and serviced at the same time and where many calls are sent from at the same time. In one embodiment, the call center is a telematics call center, facilitating communications to and from telematics device **120** in vehicle **110**. In an example, the call center is a voice call center, providing verbal communications between an advisor in the call center and a subscriber in a mobile vehicle. In another example, the call center contains each of these functions. In other embodiments, call center **170** and web-hosting portal **160** are located in the same or different facilities.

Call center **170** includes one or more communication interfaces **172**, such as voice and data modems and switches, one or more communication services managers **174**, one or more communication services databases **176**, one or more communication services advisors **178**, and one or more networks **180**.

Communication interface **172** of call center **170** connects to land network **144**. Communication interface **172** transmits voice or data transmissions from call center **170**, and receives voice or data transmissions from telematics device **120** in mobile vehicle **110** through wireless carrier system **140** and/or wireless modem **124**, communication network **142**, and land network **144**. Communication interface **172** receives data transmissions from, and sends data

transmissions to, one or more web-hosting portals **160** and telematics devices **120**. Communication interface **172** receives data transmissions from, or sends data transmissions to, one or more communication services managers **174** via one or more networks **180**.

Communication services manager **174** is any suitable hardware and software capable of providing communication services to telematics device **120** in mobile vehicle **110**. Communication services manager **174** sends to or receives data transmissions from one or more communication services databases **176** via network **180**. Communication services manager **174** sends to or receives data transmissions from one or more communication services advisors **178** via network **180**. Communication services database **176** sends to or receives data transmissions from communication services advisor **178** via network **180**. Communication services advisor **178** receives from or sends to communication interface **172** voice or data transmissions.

Communication services manager **174** facilitates one or more services, such as, but not limited to, enrollment services, navigation assistance, directory assistance, roadside assistance, business or residential assistance, information services assistance, emergency assistance, and communications assistance and retrieval of vehicle telematics device data. In an embodiment, communication services manager **174** receives technical services data from a user via user computer **150**, web-hosting portal **160**, and land network **144**. Communication services manager **174** transmits and receives operational status, instructions and other types of vehicle data to telematics device **120** in mobile vehicle **110** through wireless carrier system **140**, communication network **142**, land network **144**, wireless modem **124**, communication interface **172**, and network **180**. Communication services manager **174** stores or retrieves technical service data to and from communication services database **176**. Communication services manager **174** provides requested information to communication services advisor **178**.

In one embodiment, communication services advisor **178** is a real advisor. In another embodiment, communication services advisor **178** is implemented as a virtual advisor. In an example, a real advisor is a human being at service provider service center in verbal communication with service subscriber in mobile vehicle **110** via telematics device **120**. In another example, a virtual advisor or technical virtual advisor is implemented as a synthesized voice interface responding to requests from telematics device **120** in mobile vehicle **110**. In another embodiment, communication services advisor **178** is embodied in software executing on a computing system that provides automated technical service functions, such as for managing technical services.

Communication services advisor **178** provides services to telematics device **120** in mobile vehicle **110**. Services provided by communication services advisor **178** include enrollment services, navigation assistance, real-time traffic advisories, directory assistance, roadside assistance, business or residential assistance, information services assistance, emergency assistance, and communications assistance. Communication services advisor **178** communicates with telematics device **120** in mobile vehicle **110** through wireless carrier system **140**, communication network **142**, and land network **144** using voice transmissions, or through communication services manager **174** and communication interface **172** using data transmissions. Communication interface **172** selects between voice transmissions and data transmissions.

Mobile vehicle **110** initiates technical service requests to call center **170** by sending a voice or digital-signal command to telematics device **120** which in turn, sends an instructional signal, device identification signal or a voice call through wireless modem **124**, wireless carrier system **140**, communication network **142**, and land network **144** to call center **170**. In another embodiment, the technical service request is for a data upload that initiates a data transfer between vehicle **110** and service center **170** or web hosting portal **160** to implement a technical service. A technical service is, for example, a process that provides SID table

updates, telematics device reconfigurations, mobile configurations, programming error corrections, and phone number configurations for one or more telematics devices **120**.

In another embodiment, the mobile vehicle **110** receives a request from call center **170** to send various telematics device **120** data from mobile vehicle **110** through telematics device **120** through wireless modem **124**, wireless carrier system **140**, communication network **142**, and land network **144** to call center **170**. In one embodiment, a user initiates a service request by activating a tactile or voice-operated user interface.

FIG. 2 is a block diagram of a system for managing technical services within a mobile vehicle communications system in accordance with an embodiment of the present invention. FIG. 2 shows a technical services management system **200**. In one embodiment, the components of technical services management system **200** are operational within the illustrative operating environment of FIG. 1.

In FIG. 2, the technical services management system **200** (management system) includes a telematics service center **270**, and a mobile vehicle **210** incorporating a telematics device **220**. The service center **270** is shown including a technical services queue **276** containing pending service actions **275** and **277**, a communication interface **272** and an advisor interface **278**. The telematics service center **270** is shown having a bidirectional communication link with vehicle **210**.

Mobile vehicle **210** is any type of vehicle including a passenger vehicle, bus, truck and the like. In one embodiment, vehicle **210** and various systems of vehicle **210**, are uniquely identifiable via an assigned identification code such as, for example, a vehicle identification number (VIN) or a device identification code, such as an electronic serial number (ESN) of a vehicle system or telematics device **220**.

Telematics device **220** is any telematics device enabled for operation with a telematics service provider such as telematics device **120** as described with reference to FIG. 1. Telematics device **220** includes volatile and non-volatile memory components for storing data and programs. In one embodiment, memory components in telematics device **220** include one or more programs (not shown) for performing communication and authentication functions, and managing technical services, processes and data transfers. In an embodiment, analytic processes performed by telematics device **220** include determining telematics device failure codes, and the like. In another embodiment, a data upload module manages technical services information such as SID table data, configuration data and commands and programs. In still another embodiment, the telematics device **220** acts as a data cache for received data, prior to performing a technical serviced action on the telematics device **220**.

Telematics service center **270** is any service center providing telematics services such as call center **170** described with reference to FIG. 1. In one embodiment, service center **270** includes hardware and software for managing one or more databases with at least one database configured as technical services queue **276**. In another embodiment, service center **270** is configured to access a database that is in another location but coupled to service center **270** such as, for example, database **166** in web server **160** as described in FIG. 1. In an embodiment, technical services queue **276** contains pending technical service actions **275**, **277**. In another embodiment, technical services queue **276** includes one or more programs (not shown) for managing technical services. In yet another embodiment, technical services queue **276** is a relational database that also includes information such as, for example, vehicle makes and models, individual vehicle identification numbers (VIN) and other vehicle and telematics device identifiers, and pending technical service action data **275**, **277** corresponding to the specific vehicles identified in the database. In an embodiment, technical services such as dynamic configuration data or

instructions are provided from service center **270** to vehicle **210**. Dynamic configuration data includes instructions and data to implement technical services to reconfigure or reprogram a telematics device and the like.

Advisor interface **278** is any interface that facilitates communications between a live advisor and various computing and communications hardware of server computer of technical services management system **200**. In one embodiment, the advisor interface is a personal computer such as client, personal or user computer **150** of FIG. 1.

In operation, service center **270** manages technical services data in a telematics service provider network such as the operating environment described in FIG. 1. In an embodiment, service center **270** is enabled to maintain, and otherwise manage, an automated technical services regime for a plurality of vehicles **210**. In operation, service center **270** receives a selection of a technical service action **275** for a telematics device. The service action **275** is associated with a user account and a vehicle identification number for the user account and then assigned to a position in a technical services queuing database. A notification of a pending technical service action is then generated to alert a user to request the pending technical service. In operation, service center **270** receives a request for technical services from vehicle **210** and provides technical services data to vehicle **210** based on the identity of the requesting vehicle **210** and any pending technical service action in technical services queue **276**. Once a user is made aware of a pending technical service, the user initiates the technical service action request through a user interface that initiates an authenticated communication from vehicle **210** to service center **270**.

FIG. 3 is a process flow diagram illustrating a method for managing technical services within a mobile vehicle communications system in an embodiment of the present invention. In one embodiment, method **300** is implemented with components of the exemplary systems described with reference to FIGS. 1 and 2. In another embodiment, one or more steps of method **300** are embodied in a computer readable medium containing computer readable code such that the steps are implemented when the computer readable code is executed on a computing device. Method **300** begins in step **310**. In step **310**, a request for technical services is received from a telematics device. In one embodiment, the request for technical services is received at any time that a mobile vehicle **210** is operational. In another embodiment, the request for technical services is received subsequent to a user becoming aware of a pending technical services action at the service provider, such as for example via a notice generated to the user from the service provider. In yet another embodiment, the request for technical services includes vehicle identification data for the telematics device requesting the technical services. Vehicle identification data includes, but is not limited to, a VIN, a telematics device ESN, a telephone number a mobile identification number (MIN) and the like.

In step **320**, a technical service action is determined based on the received request for technical services. In an embodiment, the determining occurs at any time after the request is received. In one embodiment, determining a technical service action includes identifying a user account associated with the telematics device based on the received request, and determining if one or more technical service actions associated with the user account are pending in a technical services queue. In one embodiment, the request for technical services includes vehicle identification data for the telematics device requesting the technical services that is provided through an authenticating phone number for a technical services pending job queue. A service center having a database of user account information and telematics identification data retrieves customer

account data based on the vehicle identification that correlates a request for technical services with a specific technical service that is pending in a technical services job queue for one or more vehicle associated with the customer's account.

In step **330**, a technical service is provided to the telematics device responsive to the technical service action determination. In an embodiment, the technical services are provided at any time after the technical service job has been determined. In another embodiment, the technical service is delayed until a later time and a timer or trigger is set to initiate the technical service. In yet another embodiment, the technical service comprises SID table updates, telematics device reconfigurations, mobile configurations, programming error corrections, and phone number configurations. As used herein, the term "trigger" comprises a broad definition but includes a condition detected to activate a function based on a logical, physical or temporal event.

One embodiment includes maintaining a technical services queue. The queue is maintained by selecting a technical service action for at least one telematics device, associating the technical service action with a user account and a vehicle identification for the user account, assigning the associated technical service action to a position in a technical services queuing database, and generating a notification of a pending technical service action for a user based on the technical service action associated with the user account. In one embodiment, a customer is notified via a mailing that a technical service is pending or required. In another embodiment, a customer is notified via a telephone call from a real or virtual advisor that a technical service is pending or required.

Another embodiment includes generating a technical services request from the telematics device. The technical service request is generated at the telematics device by activating a user interface, receiving a command to the user interface to initiate a technical service request, and initiating a technical services communication protocol sequence based on the received command. In one embodiment, the user interface is a voice recognition interface. In another embodiment, the user interface is a designated technical services button on a telematics device.

In one embodiment initiating the technical services communication protocol sequence includes initiating a first authenticating telephone call attempt from a telematics device to a technical services queue through a first carrier by outpulsing a first telephone number and determining if the first telephone number is registered in the home location register of the first carrier where the call attempt is aborted when the first telephone number is not registered in the home location register of the first carrier; initiating a second authenticating telephone call attempt through a secondary carrier by outpulsing the first telephone number when the first telephone number is not registered in the home location register of the first carrier and then determining if the first telephone number is registered in the home location register of the second carrier wherein the call is aborted when the first telephone number is not registered in the home location register of the second carrier. Vehicle identification data is subsequently exchanged between the telematics device and the technical services queue modem when an authenticating call is verified in the home location register of the first and second carrier responsive to each above determination. In one embodiment, an authenticating telephone number is a 1-(800) telephone number that directly connects to a technical services queue in a data mode.

Another embodiment further includes initiating a third telephone call attempt from the telematics device to a call center through the first carrier by outpulsing a second telephone number when the second authenticating call attempt fails and initiating a fourth telephone call attempt from the telematics device to the call center through the second carrier by outpulsing the second telephone number when the third telephone call attempt fails. The vehicle identification data is exchanged between the telematics device and the call center modem when a telephone call is connected. In another embodiment, the second telephone number is a "CLEARED" number that connects to a service provider in a data mode. Once a call using the second telephone number is connected a modem handshake exchanges vehicle identification data, which allows automated connection to a technical services queue.

Yet another embodiment includes initiating a fifth telephone call from the telematics device to the call center through the first carrier by outpulsing a failed-to-voice telephone number when the second authenticating call attempt fails wherein the failed-to-voice number connects with an advisor interface at a call center. An advisor is then required to assist the customer by directing the customer to a technical advisor, or manually entering data into an advisor interface to complete a technical service for the customer.

The method and systems described above enable a convenient and efficient solution to managing technical services within mobile vehicle communications system. A computer-enabled embodiment of the described method provides an automated process for directing inbound and outbound communications both to and from a service provider and a vehicle to accomplish specific technical services. A significant reduction in customer service delay time, human overhead and redundancy is accomplished while also providing simultaneous service to thousands of vehicles with similar or different technical services requests.

It is anticipated that the invention will be embodied in other specific forms not described that do not depart from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive.